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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,885	03/04/2004	Hideki Kuwajima	2004_0280A	5187
513	7590	07/10/2006	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			HANNON, THOMAS R	
			ART UNIT	PAPER NUMBER
			3682	

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-14, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. US 4,398,775 in view of Lindrose et al. 6,113,277.

Hofmann discloses a bearing device comprising a first bearing device (including inner race 2) having a first retainer (left half of retainer 6 in Figure 1) with a center axis (A) along a bearing center axis; and a second bearing (including inner race 3) having a second retainer (right half of retainer 6 in Figure 1) with a center axis along the bearing center axis; the first and second bearings are arranged one upon another in an axial direction along the bearing center axis; a plurality of first grooves are provided at an outer periphery of the first retainer and are arranged to have balls (4) disposed therein, a plurality of second grooves are provided at an outer periphery of the second retainer and are arranged to have balls (5) disposed therein. The first bearing includes a first inner ring (2) to support inner sides of the first balls, and a first outer ring (7) to support outer sides of the first balls; the second bearing includes a second inner ring (3) to support inner sides of the second balls, and a second outer ring (7) to support outer sides of the balls. The first and second inner rings are separate and discrete members. The first and second outer rings are not separate and discrete members.

The plurality of first grooves is constituted by N first grooves, and the plurality of second grooves is constituted by N second grooves (inherent in the alternating arrangement). Hofmann does not specify the precise spacing of the balls, however it is claimed by Hofmann that "one set

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of balls and group of teeth is angularly offset from the other set of balls and group of teeth” (claim 3). Hofmann further describes the cage as “having two crenellated surfaces which define respective arrays of oppositely facing pockets for these bodies, the arrays being relatively staggered in peripheral direction for the purpose of saving space.” (Column 1, lines 51-54). Such an arrangement of respective arrays, and staggering fully anticipates the language of the claim.

Lindrose discloses a recording reproducing device with a head support device comprising a support arm having a slider and a voice coil coupled thereto, and a bearing device to rotatably support the support arm (Figure 1). The bearing device of Lindrose includes first and second bearings arranged one upon another in an axial direction, where the number of balls in each row of the retainer is three, and the inner races are separate and discrete members and the outer races are separate and discrete members. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hofmann to provide the race members as separate and discrete members, because this is taught and suggested by Lindrose as being a known arrangement of arranging and spacing radially adjacent ball bearings. With respect to claim 13, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the bearing arrangement of Hofmann such that the number of balls, and corresponding grooves in the retainer, to three, because this is taught and suggested by Lindrose as being the minimal number of required balls, thus minimizing the necessary preload force. With respect to claim 14, the outer housing 36 of Hofmann corresponds to the claimed outer sleeve, and the shaft 1 corresponds to the claimed inner sleeve. With respect to claims 17-19, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the

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teaching of Hofmann in known devices requiring a duplex bearing, including that taught and suggested by Lindrose et al.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. US 4,398,775 in view of Lindrose et al. 6,113,277 as applied to claim 14 above, and further in view of Albrecht et al. US 5,768,060.

Albrecht discloses a bearing assembly having the contact surfaces of the grooves on the inner and outer races with a radius of curvature that is greater than the radius of the balls. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the races of Hofmann such that the raceway grooves have a greater radius of curvature than the balls, because this is taught and suggested by Albrecht as ensuring the balls make contact at a single contact point thus minimizing preload.

Applicant's arguments filed June 8, 2006 have been fully considered but they are not persuasive. Applicant states "the Examiner recognized that the Hofmann et al. patent does not disclose the particularly-claimed arrangement of the grooves." This is not the case. It was stated that "The plurality of first grooves is constituted by N first grooves, and the plurality of second grooves is constituted by N second grooves (inherent in the alternating arrangement)." Thus it was stated clearly in the rejection that Hofmann does indeed inherently disclose the particularly claimed arrangement of the grooves. The rejection further stated "Hofmann does not specify the precise spacing of the balls, however it is claimed by Hofmann that 'one set of balls and group of teeth is angularly offset from the other set of balls and group of teeth' (claim 3)". Asserting that while there is no specific mention in the specification of a spacing of  $360/N$ , the disclosure nonetheless anticipates by the cited language. The rejection further included an alternative

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obviousness statement. In response to Applicant's arguments, the alternative obviousness statements are withdrawn, as unnecessary. The disclosure of Hofmann fully anticipates the claim language. While Applicant has couched the spacing and staggered relationship of the balls in mathematical terms, the general description of Hofmann with respect to "arrays" fully anticipates a regular and unequal spacing of the pockets. The obvious statement as to what would have been obvious to one of ordinary skill in the art is not necessary, because one of ordinary skill in the art would know from a reading of the specification of Hofmann that an array of pockets in a staggered manner fully encompasses the  $360/N$  relationship as claimed.

With respect to the separate and discrete members of the races, this is now discussed in the combination rejection of Hofmann in view of Lindrose.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Hannon whose telephone number is (571) 272-7104. The examiner can normally be reached on Monday-Thursday (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Thomas R. Hannon  
Primary Examiner  
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trh